COST ENGINEERING

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WHAT'S INSIDE

A Guide to Developing and Documenting Remedial Alternative Cost Estimates during the Feasibility Study

By Stan Hanson, HTRW-CX

Description:
An update of an early US Environmental Protection Agency (USEPA) guidance document that addresses the expectations for cost estimates of remedial action alternatives developed as part of the Remedial Investigation/Feasibility Study (RI/FS) process has been completed, in July 2000, by the USEPA and the US Army Corps of Engineers (USACE). These cost estimates are then used in the Superfund remedy selection process upon completion of the RI/FS. The goals of this update effort include the following: 1) Encourage the development of more complete and accurate cost estimates by pointing out resources for cost estimating; 2) Improve the consistency of cost estimates by presenting clear procedures and expectations; and 3) Improve the documentation of cost estimates by presenting a standard format and checklist of cost elements. The targeted audience for this guidance include: cost estimators, technical support contractors, remedial project managers (RPMs), and program managers. This guidance is intended to satisfy the needs of each of these audiences. It should provide the cost estimator and technical support contracting community with a resource tool to help them develop better cost estimates utilizing consistent procedures, and it should provide RPMs and program managers with an understanding of the nature of the cost estimates that are presented to

them and the questions they need to ask when reviewing and evaluating them. The guidance document can be downloaded from the Headquarters USACE Cost Engineering web page at > http://www.hq.usace.army.mil/cemp/e/ec/ec-regs.htm#anchorER.

Collaborating Agencies:
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers

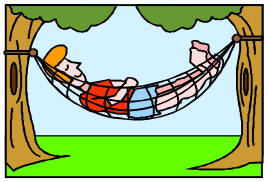
Points of Contact:

Mr. Mike Goldstein (509) 376-4919
U.S. Environmental Protection Agency
Richland, WA

Mr. Stan Hanson (402) 697-2609
U.S. Army Corps of Engineers
Omaha, NE

RETIREMENT OF JAMES B. HUDSON

By Larry Werner, Huntsville Center



Jim Hudson announced his retirement from Federal service during the recent Tri-Service Automated Cost Engineering Steering Committee meeting. His final day was 2 January 2001 and a retirement luncheon took place on 18 January 2001.

Mr. Hudson worked in the Cost Engineering arena for more than 30 years at Huntsville Division and Huntsville Engineering and Support Center. He served as both Chief, Cost Engineering Branch, and Chief, Cost Engineering Division during his distinguished career. Jim served on the Cost Engineering Steering Committee since its inception in 1990 and was chairman of the Cost Engineering Certification Board. He was also named the Cost Engineer of the Year for 1998/1999.

During his career in Huntsville, he led the cost engineering efforts on many large and complex projects with national importance including Chemical Demilitarization program, National Missile Defense program and many others. Jim will be sorely missed by the Huntsville Engineering and Support Center and the Corps of Engineers.

RE-ASSIGNMENT OF TERRY L. PATTON

By Larry Werner, Huntsville Center

The Commander, Huntsville Engineering and Support Center, has re-assigned **Terry L. Patton** from the TRACES Team to the Corporate Business Plan/P2 Team under the Systems Engineering Division effective on 12 February 2001. Terry will be a project manager for this new project, which was assigned to the Center by General Flowers late last calendar year.

Terry worked as a cooperative student with the CACES team and has been assigned permanently to the TRACES team since August 1989. As Terry developed his skills, his roles and responsibilities in the TRACES team increased dramatically. He was the project manager for the Unit Price Book, Life Cycle Cost module, PC Cost module, MCACES training and parametric models. Terry was an outstanding employee for the TRACES team and he will be sorely missed. We wish him all successes in his new job.

USACE 2000 COST ENGINEER OF THE YEAR AWARD

By Ray Lynn, CECW-EIC

We are pleased to announce that **Ms. Karen Schofield**, New England District, U.S. Army Corps of Engineers was the recipient of the "USACE 2000 Cost Engineer of the Year Award." A private, independent evaluation panel chose her entry out of 8 nomination packages received from cost professionals throughout the Corps. Ms. Schofield works at the New England District as a Certified Cost Consultant and has participated on various adhoc technical review committees during the previous year. She has a reputation for courtesy, concern, and qualities, which reflect well on the U.S. Army Corp of Engineers.

We also want to congratulate all of the nominees who entered the 2000 contest; we received many outstanding nomination packages. Our only regret was that there could only be one winner. The POC is Mr. Raymond Lynn, HQUSACE (CECW-EIC), telephone (703) 428-6994, FAX (703) 428-6975.

USACE 2001 Cost Engineer of the Year Award

By Ray Lynn, CECW-EIC

USACE "2001 Cost Engineer of the Year Award" request for nominees' memorandum was signed by General Hans A. Van Winkle on 28 Feb 01. You should be getting the information in the mail shortly. The Cost Engineer of the Year Award is presented annually to one cost engineer, civilian, or military in recognition for his or her contribution to the cost engineering profession in the fiscal year preceding the award. The program and the procedures for the award are described in ER 672-l –12 and will accompany the memo once it's sent to the divisions and districts. Through this program, USACE recognize and award a creative and dedicated cost engineer who is committed to improving the quality of cost engineering in the Corps of Engineers. This program was established to reflect the USACE vision of excellence in serving our customers and the nation. The winner of this years contest will be presented the award at the Tri-Service Cost Engineering Conference and Workshop scheduled for 18-22 June 2001, in St. Louis, MO. I encourage each of you to participate. Nomination packages should be submitted directly to HQUSACE in the format described in ER 672-l -12. Your nomination package should arrive in HQUSACE (CECW-EIC) by **30 March 2001**. The point of contact for this action is Mr. Raymond Lynn, HQUSACE (CECW-EIC), telephone (703) 428-6994, FAX (703) 428-6975

Registry of Skills (RoS)

By Ray Lynn, CECW-EIC

The RoS is a web-accessible database that contains information on the skills, abilities, education, and training of USACE team members. It is open to ALL USACE employees and can be found at ***http://ros.usace.army.mil: 8096***. It is a great opportunity for you to register your individual skills, education, and special knowledge in one searchable database.

Once fully populated by individual team members, the RoS will provide you with a quick snapshot of the vast capabilities

available throughout the Corps to support the USACE mission. The RoS can be used for readily identifying gaps in expertise that need to be filled through education, training, mentoring or development assignments, and quickly identify people with specific skills and abilities in time of need. While participation is voluntary, we encourage all team members to register in the system. The RoS provides many benefits to employees, as well as the organization and it is important that all USACE team members take personal interest and communicate these benefits to others. Please encourage all your peers to register. For additional information, contact Mr. Raymond Lynn, HQUSACE (CECW-EIC), telephone (703) 428-6994, FAX (703) 428-6975.

Robert Wong's Retirement

After serving over 32 years of loyal and dedicated federal service, **Robert Wong** has retired. His final day was 2 January 2001, and a retirement luncheon was held in his honor on 5 January 2001. During his retirement luncheon, he was given the "Meritorious Civilian Service Award" for his outstanding leadership and dedicated service he provided during his career. At HQUSACE, Robert led the cost engineering efforts on all DD1391/ENG3086 authorization and appropriation issues. The Directorate of Civil Works, Engineering and Construction Division, Cost and Economic Team and the Assistant Chief of Staff for Information Management (ACSIM) will sorely miss his services. His successes reflected great credit upon him and exemplified the highest traditions of the U.S. Army Corps of Engineers, Department of the Army, and the Nation. We wish him well.

EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule

by Rick Grubb, Walla Walla District

The new EP will be out in the summer 2001. It will be distributed on a CD in Portable Document Format (PDF) along with the CHECKRATE program (in Excel) just as the 1999 EP. The MCACES equipment databases and supporting files will now be distributed on the TRACES Cost Engineering Suite CD by Huntsville, as well as volume 1- 12 of the EP in PDF. You can still download any EP for the HQUSACE site at http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/cecw.htm or through the site at http://www.nww.usace.army.mil/cost.

There is a MCACES Equipment Database Checking Program located at http://www.nww.usace.army.mil/cost. This program will help ensure that the equipment database and supporting files are calculating the equipment rates correctly in MCACES. Please use it once you have installed the new 2001 equipment database. This will help eliminate errors in your estimates.

EM 1110-2-1304, Civil Works Construction Cost Index System

by Rick Grubb, Walla Walla District

The indexes presented in this manual are specifically designed for Civil Works construction, and are specific for each of the major Civil Works features. The indexes are used to escalate or inflate various project cost features to current or future price levels in accordance with the references in the EM.

There are state adjustment factors included in this manual that allow a project estimated in one state to be adjusted to a project in another

state. The user is cautioned that these index tables are made of historic indexes and simple projected indexes based on Office of Management and Budget (OMB) inflation factors. The cost index tables will be updated twice each year in the end of March and September. The updated cost index tables will be available on the Internet at http://www.nww.usace.army.mil/cost. The complete text with updated cost index tables will be available on the Internet at the HQUSACE documents homepage at http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-2-1304/toc.htm. Both of these documents are in Portable Document Format (PDF).

Area Cost Factors

by Jim Nichols, Huntsville Center

The Tri-Service Cost Committee met earlier this year and have prepared a revised ACF listing being submitted to the Office of the Secretary of Defense (OSD) for final approval. This list is to become the basis for preparing FY03 and FY04 budgetary estimates for military programs. This list is an interim list, revising existing database using known information to update the database. A survey is still under way by Project Time and Cost, Inc. (PT&C) and is expected to go out for final review sometime this spring. It is important that you take time to review the database in order to assure that the military installations within your jurisdiction obtain valid ACFs. For the latest official ACF database, visit the ACF folder on the TRACES web site. Once the final submittal from PT&C, Inc. has been submitted, the new database will be also loaded on the TRACES web site.

The Tri-Service Cost Committee has identified some areas where the ACF program needs to be modified, some of these refer to actual programming changes, while others refer to obtaining studies on the impact new design criteria has on the database. A study on seismic parameters and roof and wind loading criteria is to be awarded in the near future. These changes will then be incorporated into the ACF matrix factors tables. For additional information concerning the ACF database and/or the ACF program, please contact Jim Nichols (256-895-1842) or Rex McLaury (256-895-1833).

TRACES Maintenance Contract

by Jim Nichols, Huntsville Center

We have just recently awarded the TRACES Maintenance Contract (formerly held by Building Systems Design (BSD) to Project Time and Cost, Inc. (PT&C). This constitutes a change in thought process trying to put much more emphasis on cost engineering than in past contracts. We anticipate that their cost engineering expertise will become prominent during the enhancements and/or maintenance of our cost engineering software. The first major task they will be involved with will be the completion of M32. Other software PT&C will be involved with includes HAG, ACF, LCC and possibly PC Cost and Cost Risk.

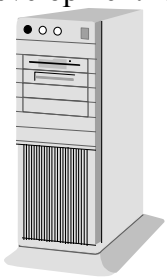
It is anticipated that, in addition to software development and maintenance, PT&C will be involved in providing hotline support and training on the TRACES software modules they are tasked to maintain. During the transition period, please direct all software

hotline support calls to Jim Nichols at 256-895-1842. We anticipate that hotline support will eventually be moved to PT&C.

Hardware Requirements

By Jim Nichols

During the past few months, I have received several requests for updates on the hardware requirements in support of the modified release of M32. Now that development is about under way to complete the M32 software, I have obtained information in order to update this hardware configuration for you. The revised software will be performing multiple computations, thus the faster the machine and hard drive access, the faster the resulting computations will be performed. Based upon the information received, I will provide a minimum and a strongly recommended format.



Component - Central Processing Unit (CPU)
Minimum - Pentium II 333
Recommended - Pentium III, 750 MHZ or better

Component - Mother Board
Minimum - Standard Pentium II Bus
Recommended - Pentium III bus, 100 MHZ throughput

Component -Memory
Minimum - 128 MB of 60 MHZ RAM
Recommended - 256 MB of 100 MHZ RAM

Component - Monitor
Minimum - 17" (800X600 resolution)
Recommended - 19"/21" (capable of 1600X1200 resolution or better)

Component - Compact Disk
Minimum - 20X Read Only
Recommended - 20X/4X Read Write

Component -Hard Drive
Minimum - 2 GB
Recommended - 8 GB or better

Component Operating System
Minimum - MS Windows NT (actually will run on windows 95 and 98)
Recommended - MS Windows 2000

M32 Development

By Jim Nichols, Huntsville Center

Several of you have inquired concerning the status of the M32 development, stating that it is getting increasingly hard to continue using MCACES Gold Version 5.31 to prepare detailed construction cost estimates. Also, the original releases of M32 were very disappointing and left much to be desired (much less M32 could not be relied upon to provide reliable estimates and was subject to many crashes). With the award of the new TRACES Maintenance Contract to PT&C, we are now ready to clean up and complete the M32 development.

During the past year, we have tasked Bill Smith of EMB Pro to develop a detailed design report, identifying what needs to be done in order to make M32 much more user friendly and to remove nearly all possibilities for software crashes. Many specific recommendations have been identified and are sure to happen resulting in a system, which will be reliable and quite responsive. Mr. Smith is trying to keep the look and feel of M32 similar to the original release, but is recommending software and procedural changes, which will drastically improve the stability, as well as the usability of the software. The design document is nearly finished and will be the basis for the completion of M32. Later this month PT&C is to provide a schedule and their

understanding of what is required for the completion of M32. It is anticipated that, if funds are available, we will have new software ready for release by the end of the calendar year, maybe sooner. This software will be thoroughly tested and will not be released until it is confirmed that the calculations are correct and the software is deemed to be very stable.

As development proceeds, we intend to put updates out via e-mail to all cost engineers. We want to make sure that you are informed as to the status of this software during this development cycle. We plan to post updates and possibly beta releases on the Web for you to review as time allows. The first release of the software is intended to address the basics for preparing detailed construction cost estimates, to include simple assemblies and crews as an assembly. Future releases are already anticipated to address issues like scheduling, smart assemblies, modeling, etc.

M32 Name

By Jim Nichols, Huntsville Center

Headquarters (CECW-EIC) and the TRACES Team at Huntsville (CEHNC-ED-ES-A) are holding a contest and is seeking your to participation. We are looking for a new name, acronym, and logo for MCACES for Windows, 32-bit (M32). We would like for each of you to get involved and provide recommendations for the new name, acronym, and logo. The selected name, acronym, and logo will be announced at the Tri-Service Cost Engineering workshop scheduled for 19 through 21 June 2001. The person submitting the winning name will be recognized sometime during the conference with possibly a prize to boot.

Here are the requirements:

1) The name and acronym need to reflect an affiliation with MCACES.

2) The name and acronym must not conflict with other DoD and/or Corps utilized acronyms. If not certain, go ahead and submit, and we will verify if acronym is currently being used.

3) The logo must be submitted electronically and must be easily reproduced via standard procedures. In other words, the logo must be in .BMP, .TIF, or a .JPG file format.

4) All submittals must be received by the TRACES Team (CEHNC-ED-ES-A) no later than **18 May 2001**.

Cost Risk

By Rex McLaury, Huntsville Center

Cost Risk is a risk analysis tool that interfaces with RACER and PACES parametric cost estimating programs. In addition, Cost Risk also allows one to develop stand-alone estimates using one of several WBSs for related construction types (Military, Civil Works, HTRW, etc). Talisman Partners, Ltd developed the software based upon design guidance from the development team (including DoD and DoE personnel plus Dr. James Diekmann from the University of Colorado). Cost Risk uses Crystal Ball (a commercial off-the-shelf add-on to Microsoft Excel) as the computational engine to determine the "riskiness" of a project. By evaluating the components of the project, including materials, labor, building parameters, etc. you can perform an analysis of the project to determine the level of confidence that the project may be awarded and constructed based upon the current government estimated amount. Cost Risk will present graphical distributions, which display confidence % and associated contingency for that confidence.

There is currently a final release of the software available, but a new task order is being issued to address a couple of items deemed necessary prior to the official release of the software. The next step will be Phase III, which is the development of training material and associated training. It has been proposed that we develop one of the following: Computer Base Training (CBT) on CD-ROM or on-site training workshops. Funding for the training is not currently available, but we are working with DoE and HQUSACE to obtain funds to develop the training material.

Please visit the TRACES "What's New" page on the TRACES Web site: http://www.hnd.usace.army.mil/traces/whats-new.asp to obtain the latest PowerPoint update for Cost Risk.

HAG

By Rex McLaury, Huntsville Center

The current HAG version 2.1 is the latest release and is Y2K compliant. The latest database, which includes revised Air Force, Navy, and Army data is currently available on the TRACES FTP site (http://www.hnd.usace.army.mil/traces/whats-new.asp).

There is now a FTP site specifically for uploading of new and/or revised project data files. It is a very simple process and eliminates the confusion of who to send data to. From now on, make sure that all your project data is sent to the FTP site, otherwise we can not

guarantee that the information will be incorporated into the official database. Also, there is no need to send whole database. As a minimum, only new facilities are required (NPM) for submittal and preferably those facilities which one can determine a $/UM (dollar/square foot or square meter). Please do not send facilities that have $/LS, as this info has no usefulness for HAG database and is a waste of time for the sender. Although okay, it is not necessary to send facilities that are alterations, additions, and the like since this data is only a benefit for your records.

It is to everyone's benefit that we provide accurate data for the HAG database. The data is used by the Tri-Services to validate OSD pricing guidelines. The data is also used to verify the number of contractors typically bidding on projects at each installation; thus updating the ACF matrix factors number of bidders for each installation. If the data submitted is insufficient or not submitted then there is no way to validate the unit cost pricing guideline nor to validate the number of bidders for the ACF, each which may have impact on future work while preparing budgetary costs for new projects.

Please visit the TRACES "What's New" at http://www.hnd.usace.army.mil/traces/whats-new.asp to obtain the latest status update on HAG in PowerPoint.

TRACES Web Page

By Rex McLaury, Huntsville Center

There are several changes/enhancements to the TRACES Web Page for you to check out. These changes are being made so that we can better support you and to keep you better informed. These enhancements are:

1. Tri-Service Cost Estimating Calendar. This calendar is currently available for your use in scheduling events, meeting dates, etc. To access the calendar go to the TRACES Web Site:

http://www.hnd.usace.army.mil/traces/whats-new.asp, and then go to middle right hand of table and click the calendar icon. If you need to add information to calendar please contact Ms. Jan James, 256-895-1832, and request access rights to add information. Ms. James will be updating calendar of events.

2. ECP (Engineering Change Proposal). This software will be used to develop and track bugs, changes, and/or proposed enhancements throughout the complete review and development cycle. This software will allow you to input new requests, query the status of requests, and find out when proposed change is projected to be implemented once it has been approved. At this time we are making some corrections to the software to address some security issues, but it should be available around the first week in April and we will notify you via email. Bear with us as we push to finalize and make available to you via internet. You should use your current username/password to access.

3. FAQs (Frequently Asked Questions). Soon the TRACES Web Page will have a site for the purpose of proposing questions and obtaining support from the field concerning resolutions to TRACES Software. This is a way that we can help each other resolve problems we are experiencing. The FAQ software will have the flexibility to perform database searches based upon keyword phrases or relevant topics. This will be a database for users to locate information provided by other Corps folks regarding software problems, patches, fixes, updates, improvements, etc. The nice thing about this system is it will allow searches on just about any word, work phrase, error message, letter, etc. If anyone had encountered such a problem, it will be in the database. Those questions not having a resolution will be available to you for answer in the pending questions area. The master database will be maintained by HNC for accuracy while the pending file will allow you to reply with solution. Expected delivery date is April 2001.

4. Username and passwords, Software and FTP site access.

Each Cost Engineer should now have a username and a password so that you can access the TRACES FTP site and download the latest software and databases. Also, the FTP site can provide a means for you to share databases such as project files, etc. The FTP site is open to any cost engineer, once they have obtained a username and password. If you are having trouble accessing the FTP site, contact either Rex McLaury at 256-895-1833 or Jan James at 256-895-1832.

We are also in the process of setting up standard procedures for providing AE firms access to the TRACES software, databases, and FTP site. We will address two different scenarios, one for AE firms who don't have a current contract with the Corps of Engineers and the other for those AE firms who do have active contracts. Those contractors who do not have current contracts will only be allowed to download the MCACES Gold 5.31, MFW 1.2 and/or the 1995 Unit Price Book database. These firms will not be given access to the TRACES FTP site. For those contractors who do have a current contract, validated by the district office, we will provide the following: 1) access to the same software and databases as those contractor not validated, 2) a folder on the FTP site where the AE can access, upload and download files, and 3) the latest UPB database. Those validated contractors will only be able to access those folders set up specifically for them plus the district office will have access to the same
folder, thus the AE firm and the district office can transfer information across the internet and avoid the problems associated with e-mail virus checks, etc.

Don't forget that your contracting folks and you need username and passwords and the current operating procedure is available on TRACES web page: http://www.hnd.usace.army.mil/traces/. As we learn more about your needs, we will revise the operating procedure and try to better accommodate your needs. It is our goal to provide you this support so that you can interface with your AE firms more efficiently.

COST ENGINEERING PHONE DIRECTORY

By Jan James, Huntsville Center

The 19 February 2001 edition of the Cost Engineering Phone Directory is now available on Headquarters' web page at the following address: http://www.hq.usace.army.mil/cemp/e/ec/Telephone/CostEngrPhone.doc. All cost engineers received a copy by email in February and a lot of Divisions and Districts sent in revisions. These revisions have been incorporated and within the next week or so, a list of Air Force and Navy Cost Engineers will be added. A new version will be uploaded to the Headquarters' web page soon. You will be notified by email as soon as it is available.

Estimating Budget Costs for OE (Ordnance & Explosive) Projects

By Kate Peterson & Jim Peterson, HTRW CX

Sub-Title: OE Models in the RACER (Remedial Action Cost Engineering Requirements) System

Development of accurate and consistent cost estimate for projects and their associated phases is a critical step to any organization responsible for budget submissions, contract negotiations, and/or financial decision-making. One of the tools available to develop estimates is the RACER System. RACER is a parametric, integrated cost estimating software system specifically developed for estimating costs associated with environmental remediation projects. RACER provides a range of cost estimating detail from an order-of magnitude in a project's preliminary stages to a refined, detailed definitive estimate at the time of project execution.

With the recent high visibility of OE projects, the US Army Corps of Engineers has developed new RACER OE cost models to enable project and program teams to develop more reasonable and defendable cost estimates for OE projects. Each of these OE models can be coupled with other existing RACER models to develop an estimate for the total project cost. It is *very important* to note that these models are *not* static and are frequently updated, as new information becomes available. The RACER OE models include:

- **Archive Search Report Model.** The ASR model in RACER is used for development of costs in the site inspection phase of many projects. The primary purpose of the ASR is to provide an overall evaluation at a site to differentiate those sites (current or former) that pose a potential threat to public health, welfare, or the environment.
  Typically, the ASR is qualitative in nature and includes information derived from historical research, site inspection, evaluation, and documentation, rather than definition of the nature and extent of explosive ordnance through intensive site investigation. The major cost driver for this model is the complexity of the site, which is based upon the size of the site,

  the types of ordnance used and the projected land use.

- **OE Engineering Evaluation/Cost Analysis Model.** The OE EE/CA model is used to estimate the cost to characterize the nature, location, and concentration of Ordnance and Explosives (OE) by providing:

  -A description of the OE related problems affecting human use of the site

  -identification and analysis of reasonable risk management alternatives

  -recommendations for a proposed alternative

  -seeks public comments and participation, and

  -documents the process for use in final decision making and judicial review.

  This model may be used to develop costs for the EE/CA or RI/FS project phases. The major cost driver in this model is area of the site that will be sampled.

- **Ordnance and Explosive Removal Action Model** - This quantitative model is designed to estimate the costs of searching for, marking, and removing unexploded ordnance (UXO) from munitions contaminated property. The major cost drivers are the area to be cleared and the depth of OE clearance. Other factors include site conditions and the variety and concentration of munitions to be cleared.

- **Ordnance and Explosive Institutional Controls Model** - This model combines estimates for options of legal controls on land use to limit the public's exposure to OE and passive controls and engineered solutions to limit the public's exposure to OE. Examples of elements in this model include programs to educate individuals about potential exposure risks, response actions, emergency plans, etc.; the legal options available: including controls related to ownership of the land, easements, zoning and siting restrictions, etc.; and engineering controls that limit the public's access to a site. Engineering controls and site complexity are the major cost drivers in this model.

- **Ordnance and Explosive Monitoring Model** - This model addresses the cost of site monitoring following the implementation of an OE Removal Action project to assess the effectiveness of the removal. Monitoring is necessary to ensure that public health, safety, and the environment are being protected by the response action that was implemented. Monitoring is performed over periodic intervals. The major cost drivers in this model are number of years and events of monitoring and site complexity.

Huntsville Design Center and the Hazardous, Toxic, and Radioactive Waste Center of Expertise developed the RACER OE models and intend to keep verifying the models using historical data and incorporating user comments. In addition research into recently developed innovative technologies and applied engineering solutions may be used to update the models in 2001. These efforts enhance the Corps' ability to continue to estimate defendable budget estimates for OE projects.

OE Project CTC Estimate

PA, SI, EE/CA, or RI/FS Phase Costs *can be developed with the following models:*

-ASR Model
-OE EE/CA Model
-Site Investigation
-Remedial Investigation
-Feasibility Study

RD Phase Costs *can be developed with these*

TRI SERVICE
COST ENGINEERING
WORKSHOP

19 – 22 June 2001

Adam's Mark Hotel
St. Louis, MO

Details are currently being confirmed and you will be receiving a letter in the near future. Be sure to put these dates on your calendar.

Caption: *Models that can be included in a project to develop a cost to complete estimate using CERCLA phases*.